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EXAMINER

LYONS, MICHAEL A

ART UNIT PAPER NUMBER

2877

DATE MAILED: 06 03 2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/051 507

Examiner

Michael A. Lyons

Applicant(s)

MAEDA MINORU

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED. 35 U.S.C. § 133.
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(d).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_\_
- 2a) ☐ This action is FINAL.
- 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-34 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 January 2002 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of
- 1 ☐ Certified copies of the priority documents have been received
- 2 ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_
- 3 ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- 4 ☐ The attached detailed Office action for a list of the certified copies not received
- 5 ☐ A claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application)
- 6 ☐ A claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application)

## Attachment(s)

References Cited: PTO/STP  
Drawing: PTO/STP  
Drawing: PTO/STP

Not a  
Other

Patent No.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Luke et al (6,137,573).**

Regarding claim 1, Luke (Fig. 1) discloses a Michelson interferometer with a collimating lens 44, a first beam splitter 46, a first reflector 56, a second reflector 64, the beam splitter and reflector pair making up the interference pattern generating means. Luke also discloses a second beam splitter 66, a first photodetector 78, a second photodetector 82, and a computer 84 for a signal processor. The device, however, fails to disclose a first and second slit provided in front of the photodetectors.

The addition of slits in front of a photodetector would only serve to restrict the amount of light striking the photodetector, and the addition of such slits to an optical device is well known. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add a first and second slit in front of the first and second photodetector of Luke to control the amount of light striking the photodetectors.

As for claim 2, reflector 56 is already movable, but the act of inclining the reflector to generate the interference pattern is well known.

As for claim 3, the insertion of a wedge in an optical path to change the characteristics of the light and thereby create interference is well known in the art.

As for claims 4 and 5, the varying width and slit positioning is a matter of design choice.

As for claim 6, the specific size and position variation of the photodetectors is a matter of design choice.

**Claims 7-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dou et al (5,684,545).**

Regarding claim 7, Dou (Fig. 1) discloses a Mach-Zehnder interferometer with a first beam splitter 14, a first reflector 20, a second reflector 22, and a second beam splitter 26, the second beam splitter and reflector pair being the interference pattern generating means. Dou also discloses a third beam splitter 46, a first CCD 34, a second CCD 48, and monitors 38 and 52 to process the signals generated by the CCDs. The device, however, fails to disclose a collimating lens or a first and second slit.

The addition of a collimating lens and a first and second slit to a device is well known, as the collimating lens merely collimates light without changing its properties while the slits control the amount of light passing through that particular region of the device. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add the collimating lens and slit pair to the device of Dou to collimate and control the amount of light passage, respectively.

As for claims 8 and 10, the inclination of a reflector or beam splitter to change a property of light to generate interference is well known.

As for claim 9, the insertion of a wedge in an optical path to change the characteristics of the light and thereby create interference is well known in the art.

As for claims 10 and 11, the varying width and slit positioning is a matter of design choice.

As for claim 12, the specific size and position variation of the photodetectors is a matter of design choice.

**Claims 13-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dou et al (5,684,545).**

Regarding claim 14, Dou (Fig. 1) discloses a Mach-Zehnder interferometer with a first beam splitter 14, a first reflector 20, a second reflector 22, and a second beam splitter 26, the second beam splitter and reflector pair being the interference pattern generating means. Dou also discloses a first CCD 34, a second CCD 48, and monitors 38 and 52 to process the signals generated by the CCDs. The device, however, fails to disclose a collimating lens or a first and second slit.

The addition of a collimating lens and a first and second slit to a device is well known, as the collimating lens merely collimates light without changing its properties while the slits control the amount of light passing through that particular region of the device. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add the collimating lens and slit pair to the device of Dou to collimate and control the amount of light passage, respectively.

As for claims 15 and 17, the inclination of a reflector or beam splitter to change a

As for claim 16, the insertion of a wedge in an optical path to change the characteristics of the light and thereby create interference is well known in the art.

As for claims 18 and 19, the varying width and slit positioning is a matter of design choice.

As for claim 20, the specific size and position variation of the photodetectors is a matter of design choice.

**Claims 21-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dou et al (5,684,545).**

Regarding claim 21, Dou (Fig. 1) discloses a Mach-Zehnder interferometer with a first beam splitter 14, a first reflector 20, a second reflector 22, and a second beam splitter 26, the second beam splitter and reflector pair being the interference pattern generating means. Dou also discloses a third beam splitter 46, a first CCD 34, a second CCD 48, and monitors 38 and 52 to process the signals generated by the CCDs. The device, however, fails to disclose a collimating lens or a first and second slit.

The addition of a collimating lens and a first and second slit to a device is well known, as the collimating lens merely collimates light without changing its properties while the slits control the amount of light passing through that particular region of the device. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add the collimating lens and slit pair to the device of Dou to collimate and control the amount of light passage, respectively.

In addition, while the interferometer of Dou is not arranged such that the light passes

second beam splitter, it would have been obvious to one of ordinary skill in the art at the time the invention was made to rearrange the parts to suit the claimed order, since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japiske*, 86 USPQ 70.

As for claims 22 and 24, the inclination of a reflector or beam splitter to change a property of light to generate interference is well known.

As for claim 23, the insertion of a wedge in an optical path to change the characteristics of the light and thereby create interference is well known in the art.

As for claims 25 and 26, the varying width and slit positioning is a matter of design choice.

As for claim 27, the specific size and position variation of the photodetectors is a matter of design choice.

**Claims 28-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dou et al (5,684,545).**

Regarding claim 28, Dou (Fig. 1) discloses a Mach-Zehnder interferometer with a first beam splitter 14, a first reflector 20, a second reflector 22, and a second beam splitter 26, the second beam splitter and reflector pair being the interference pattern generating means. Dou also discloses a first CCD 34, a second CCD 48, and monitors 38 and 52 to process the signals generated by the CCDs. The device, however, fails to disclose a collimating lens or a first and second slit.

The addition of a collimating lens and a first and second slit to a device is well known in

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the amount of light passing through that particular region of the device. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add the collimating lens and slit pair to the device of Dou to collimate and control the amount of light passage, respectively.

In addition, while the interferometer of Dou is not arranged such that the light passes from the first beam splitter to the first reflector directly to the second reflector and then to the second beam splitter, it would have been obvious to one of ordinary skill in the art at the time the invention was made to rearrange the parts to suit the claimed order, since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japisko*, 86 USPQ 70.

As for claims 29 and 31, the inclination of a reflector or beam splitter to change a property of light to generate interference is well known.

As for claim 30, the insertion of a wedge in an optical path to change the characteristics of the light and thereby create interference is well known in the art.

As for claims 32 and 33, the varying width and slit positioning is a matter of design choice.

As for claim 34, the specific size and position variation of the photodetectors is a matter of design choice.

### *Conclusion*

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US Pat. 4,832,492, a heterodyne Michelson interferometer for polarization

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measurements to Calvani et al., and US Pat. 5,574,557, an apparatus and method for performing sub-poissonian interference measurements using an intensity-squeezed state to Bjork et al.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael A. Lyons whose telephone number is 703-305-1933.

The examiner can normally be reached on Monday thru Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G Font can be reached on 703-308-4877. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-0725 for regular communications and 703-308-0725 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0935.

MAI.  
May 28, 2003



Frank G. Font  
Supervisory Patent Examiner  
Technology Center 2800